



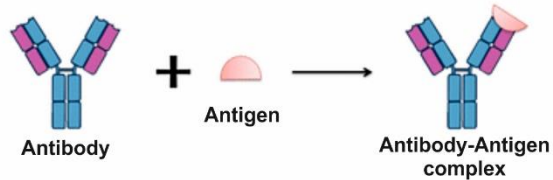
BGRS/SB-2020

06-10 July 2020,
Novosibirsk, Russia

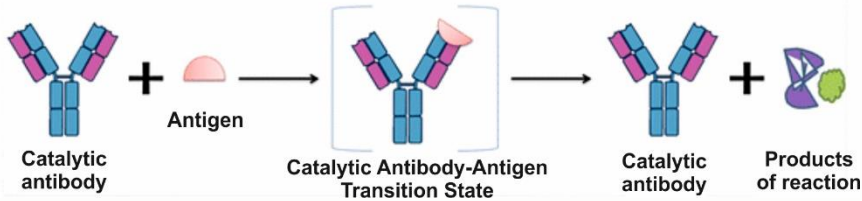
Immunoglobulins with proteolytic activity as a biomarker of impaired humoral immune system in schizophrenia

Evgeny Ermakov, Valentina Buneva, and Georgy Nevinsky
ICBFM SB RAS; NSU, Novosibirsk, Russia

The classic function of antibodies

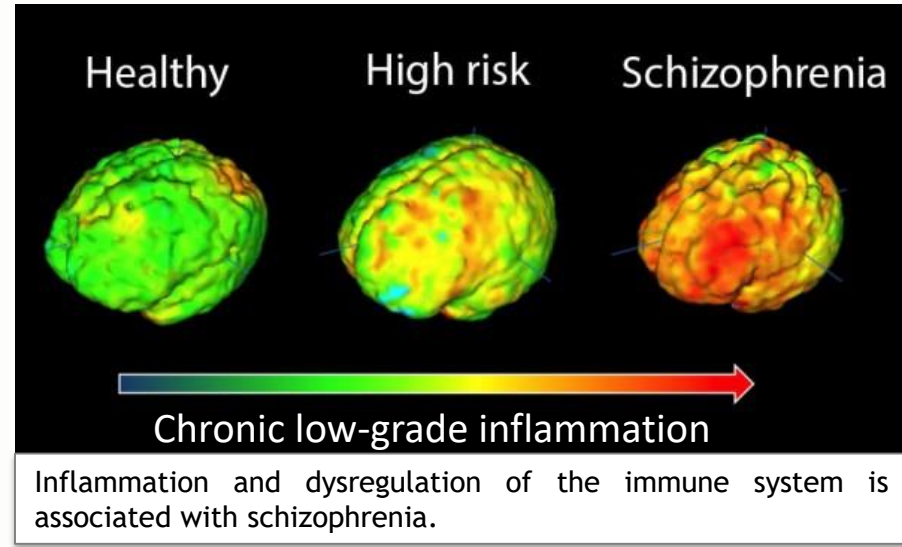


The catalytic function of antibodies



Catalytic antibodies (abzymes) are immunoglobulins that can not only bind an antigen, but also hydrolyze this molecule.

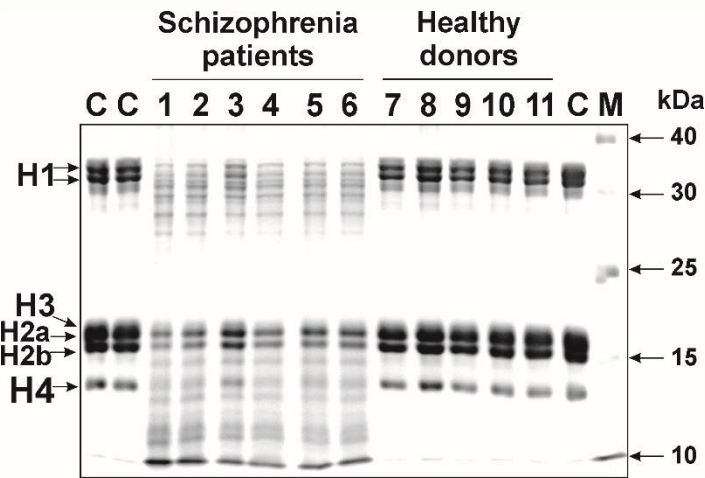
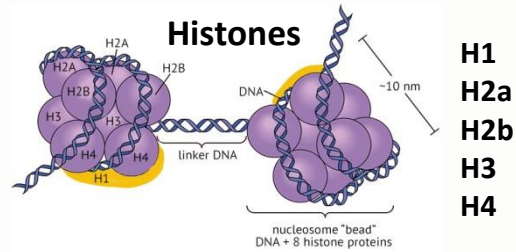
The generation of catalytic antibodies is an early sign of humoral immune system pathology.



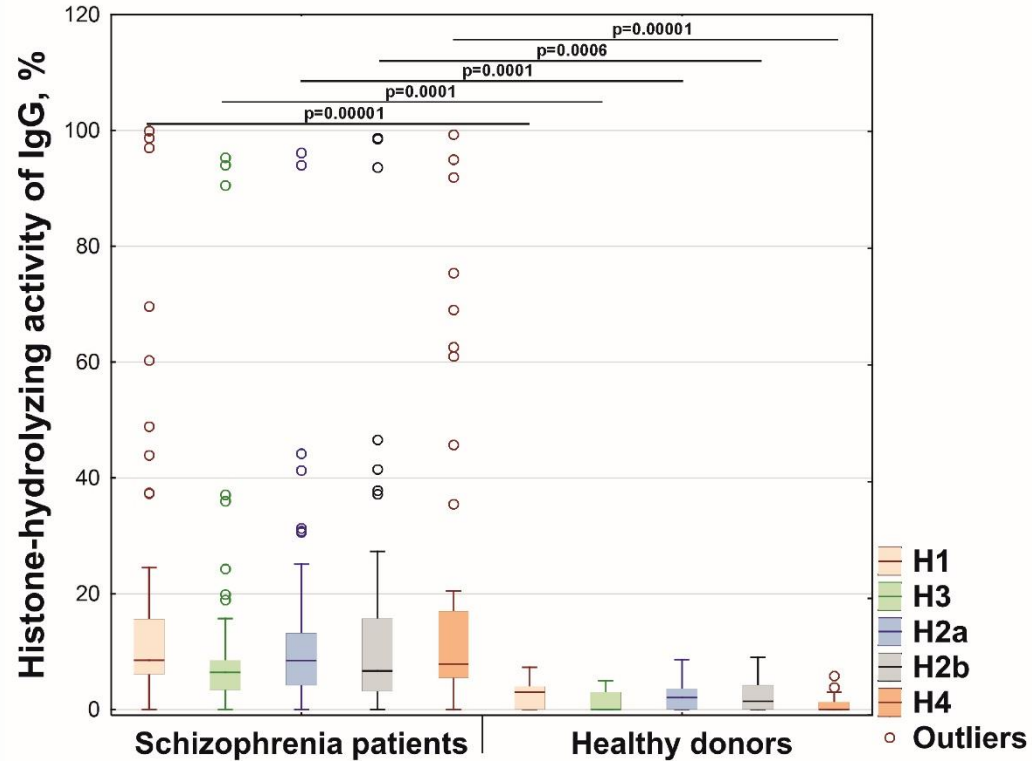
Recently, catalytic IgGs hydrolyzing DNA and RNA were revealed in serum of patients with schizophrenia.

In this work, we showed that such catalytic antibodies also hydrolyze various histones.

Catalytic IgG antibodies in serum of schizophrenia patients hydrolyze histones



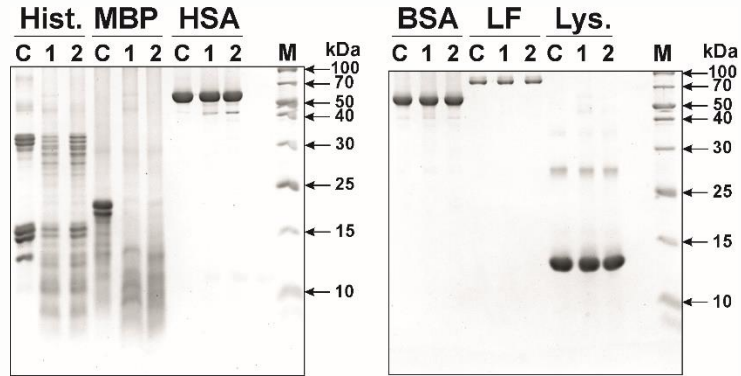
SDS PAGE analysis of the histones hydrolysis after their incubation for 20 hours with isolated IgGs of healthy individuals and schizophrenia patient.



The hydrolysis level of all histones by IgGs of patients with schizophrenia was statistically significantly higher than that of healthy donors.

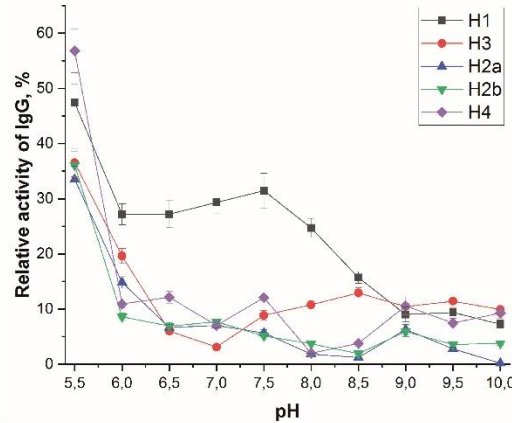
Biochemical properties of catalytic IgGs of schizophrenia patients

Substrate specificity



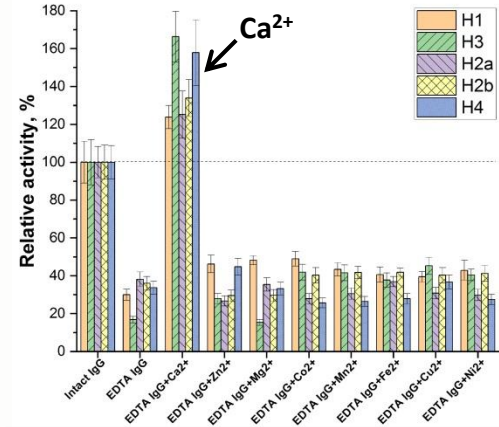
The catalytic IgGs of schizophrenia patients hydrolyzed histones and myelin basic protein (MBP) but no other tested proteins.

pH-dependency



The catalytic IgGs had a broad optimum pH and showed the highest activity at acidic pH.

Metal-dependency



The activity of IgGs was metal dependent. The Ca²⁺ ion had the greatest influence.

The take-home message

- The generation of histone-hydrolyzing antibodies is new evidence of impaired humoral immune system in schizophrenia
- Catalytic antibodies can minimize inflammatory reactions through removing histones from the bloodstream